



Attorney Docket No. MPI00-212CP1CN1M

USSN: 10/644,671

EXHIBIT A

ALIGNMENT of B7H2 long and short forms from 00-212CP1, SEQ2 and SEQ4

ALIGN calculates a global alignment of two sequences
version 2.0uPlease cite: Myers and Miller, CABIOS (1989)

>B7H2 long - SEQ 2 - 00-212CP1

273 aa vs.

>B7H2 short - SEQ ID 4 - 00-212CP1

183 aa

scoring matrix: BLOSUM50, gap penalties: -12/-2

66.7% identity; Global alignment score: 993

10 20 30 40 50 60
/tmp/s MIFLLLMLSLELQLHQIAALFTVTPKELYIEHGSNVTL ECNFDTGSHVN LGA ITASLQ
B7H2 MIFLLLMLSLELQLHQIAALFTVTPKELYIEHGSNVTL ECNFDTGSHVN LGA ITASLQ
10 20 30 40 50 60

70 80 90 100 110 120
/tmp/s KVENDTSPHRERATLLEEQLPLGKASFHIPQVQRDEGQQYCIIIIYGVAWDYKYLT LKV K
B7H2 KVENDTSPHRERATLLEEQLPLGKASFHIPQVQRDEGQQYCIIIIYGVAWDYKYLT LKV K
70 80 90 100 110 120

130 140 150 160 170 180
/tmp/s ASYRKINTHILKVPETDEVELTCQATGYPLAEVSWPNVSVPANTSHSRTPEGLYQVTSVL
B7H2 G-----

190 200 210 220 230 240
/tmp/s RLKPPPGRNFSCVFWNTHVRELTLASIDLQSQMEPRTHPTWLLHIFIPSCI IA FIFIATV
B7H2 ----- QMEPRTHPTWLLHIFIPSCI IA FIFIATV
130 140 150

250 260 270
/tmp/s IALRKQLCQKLYSSKD TTKRPVTTKREVNSAI
B7H2 IALRKQLCQKLYSSKD TTKRPVTTKREVNSAI
160 170 180

REC'D APR 16 2002 APR 5 2002

Received By *JAM*

APRIL 01, 2002

PTAS

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Washington, DC 20231
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101974875A

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NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

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PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, ASSIGNMENT DIVISION, BOX ASSIGNMENTS, CG-4, 1213 JEFFERSON DAVIS HWY, SUITE 320, WASHINGTON, D.C. 20231.

RECORDATION DATE: 01/22/2002

REEL/FRAME: 012534/0752

NUMBER OF PAGES: 13

BRIEF: ASSIGNMENT OF ASSIGNEE'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNEE:

COYLE, ANTHONY J.

DOC DATE: 11/05/2001

ASSIGNEE:

FRASER, CHRISTOPHER C.

DOC DATE: 11/13/2001

ASSIGNEE:

MANNING, STEPHEN

DOC DATE: 11/02/2001

ASSIGNEE:

MILLENNIUM PHARMACEUTICALS, INC.
75 SIDNEY STREET
CAMBRIDGE, MASSACHUSETTS 02139

SERIAL NUMBER: 09910174

FILING DATE: 07/20/2001

PATENT NUMBER:

ISSUE DATE:

COPY

ALSTON & BIRD
RTA
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4/8/02 WW

4/11
4/16/02

KIMBERLY WHITE, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS



101974875

To the Honorable
Please record the a

FORM COVER SHEET Patents Only

Attorney Dkt. No.: 35800/236924 (5800-149A)

<p>1. Name of conveying party(ies): Anthony J. Coyle Christopher C. Fraser Stephen Manning <i>1/23/02</i></p> <p>Additional name(s) of conveying party(ies) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>		<p>2. Name and address of receiving party(ies): Millennium Pharmaceuticals, Inc. 75 Sidney Street Cambridge, MA 02139</p> <p>Additional name(s) & address(es) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>
<p>3. Nature of conveyance: <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger <input type="checkbox"/> Security Agreement <input type="checkbox"/> Change of Name <input type="checkbox"/> Other _____ Execution Date: <u>Anthony J. Coyle, 11/5/01;</u> <u>Christopher C. Fraser, 11/13/01; Stephen Manning,</u> <u>11/2/01</u> </p>		
<p>4. Application No. <u>09/910,174; Filed July 20, 2001</u></p>		Patent No. _____
<p>If this document is being filed together with a new application, the execution date of the application is: _____</p>		
<p>Additional numbers attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p>		
<p>5. Name and address of party to whom correspondence concerning document should be mailed: CUSTOMER NO. 00826 ALSTON & BIRD LLP Bank of America Plaza 101 South Tryon Street, Suite 4000 Charlotte, NC 28280-4000</p> <p>05/2002 GT0N11 00000083 09910174 FC:581 40.00 DP</p>		<p>6. Total number of applications and patents involved: 1</p>
<p>7. Total fee (37 CFR 3.41) <u>\$40.00</u></p> <p><input checked="" type="checkbox"/> Enclosed <input type="checkbox"/> Authorized to be charged to deposit account</p>		
<p>8. Deposit account number: 16-0605</p>		
<p style="text-align: center;">DO NOT USE THIS SPACE</p>		
<p>9. Statement and signature: <i>To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.</i></p> <p><i>Leslie T. Henry</i></p> <p>Name of Person Signing: Leslie T. Henry</p> <p>Reg. No. 45,714</p> <p><i>November 20, 2001</i></p> <p>Date</p>		
<p>Total number of pages including cover sheet, attachments, and document: <u>15</u></p>		

ASSIGNMENT

THIS ASSIGNMENT, made by us, Anthony J. Coyle, citizen of the United States of America, residing at 30 Clarendon Street, Boston, Massachusetts 02116; Christopher C. Fraser, citizen of the United States of America, residing at 52 Grassland Street, Lexington, Massachusetts 02421; and Stephen Manning, citizen of the United States of America, residing at 151 Mystic Street, Apt. M5, Arlington, Massachusetts 02474, respectively;

WITNESSETH: That,

WHEREAS, we are the joint inventors of certain new and useful improvements in B7-H2 MOLECULES, NOVEL MEMBERS OF THE B7 FAMILY AND USES THEREOF for which an application for United States Letters Patent has been filed in the United States Patent and Trademark Office on July 20, 2001, under Application No. 09/910,174, and

WHEREAS, Millennium Pharmaceuticals, Inc., a Delaware corporation having a principal place of business at 75 Sidney Street. Cambridge, County of Middlesex, State of Massachusetts 02139, hereinafter referred to as assignee, is desirous of acquiring the entire right, title and interest in and to said invention as described in said application, and in and to any and all Letters Patent which shall be granted therefor in the United States of America and all foreign countries;

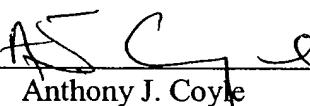
NOW, THEREFORE, To Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, we have sold and by these presents do hereby sell, assign, transfer, and convey unto the said assignee, its successors and assigns, the entire right, title, and interest in and to the said invention and application, and in and to any and all continuations, continuations-in-part, or divisions thereof, and in and to any and all Letters Patent of the United States of America and all foreign countries or reissues thereof which may be granted therefor or thereon, for the full end of the term for which said Letters Patent may be granted, together with the right to claim the priority of said application in all foreign countries in accordance with the International Convention, the same to be held and enjoyed by said assignee, its successors and assigns, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

We hereby request that said Letters Patent be issued in accordance with this assignment.

We further covenant and agree that, at the time of the execution and delivery of these presents, we possess full title to the invention and application above-mentioned, and that we have the unencumbered right and authority to make this assignment.

We further covenant and agree to bind our heirs, legal representatives, and assigns promptly to communicate to said assignee or its representatives any facts known to us relating to said invention, to testify in any interference or legal proceedings involving said invention, to execute any additional papers which may be requested to confirm the right of the assignee, its representatives, successors, or assigns to secure patent or similar protection for the said invention in all countries and to vest in the assignee complete title to the said invention and Letters Patent, without further compensation, but at the expense of said assignee, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this 5th day of November, 2001.



Anthony J. Coyle (SEAL)

Christopher C. Fraser (SEAL)

Stephen Manning (SEAL)

STATE OF Massachusetts)
)
COUNTY OF Middlesex)

I, Simonne Corriveau, a Notary Public for said County and State, do hereby certify that Anthony J. Coyle personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 5th day of November, 2001.

(Official Seal)

Simonne Corriveau
Notary Public

My commission expires: 9/1/2006

STATE OF _____)
)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Christopher C. Fraser personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

My commission expires: _____

STATE OF _____)
)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Stephen Manning personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

My commission expires: _____

RTA01/2101419vl

ASSIGNMENT

THIS ASSIGNMENT, made by us, Anthony J. Coyle, citizen of the United States of America, residing at 30 Clarendon Street, Boston, Massachusetts 02116; Christopher C. Fraser, citizen of the United States of America, residing at 52 Grassland Street, Lexington, Massachusetts 02421; and Stephen Manning, citizen of the United States of America, residing at 151 Mystic Street, Apt. M5, Arlington, Massachusetts 02474, respectively;

WITNESSETH: That,

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NOW, THEREFORE, To Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, we have sold and by these presents do hereby sell, assign, transfer, and convey unto the said assignee, its successors and assigns, the entire right, title, and interest in and to the said invention and application, and in and to any and all continuations, continuations-in-part, or divisions thereof, and in and to any and all Letters Patent of the United States of America and all foreign countries or reissues thereof which may be granted therefor or thereon, for the full end of the term for which said Letters Patent may be granted, together with the right to claim the priority of said application in all foreign countries in accordance with the International Convention, the same to be held and enjoyed by said assignee, its successors and assigns, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

We hereby request that said Letters Patent be issued in accordance with this assignment.

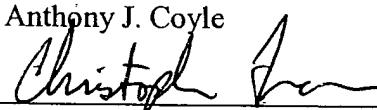
We further covenant and agree that, at the time of the execution and delivery of these presents, we possess full title to the invention and application above-mentioned, and that we have the unencumbered right and authority to make this assignment.

We further covenant and agree to bind our heirs, legal representatives, and assigns promptly to communicate to said assignee or its representatives any facts known to us relating to said invention, to testify in any interference or legal proceedings involving said invention, to execute any additional papers which may be requested to confirm the right of the assignee, its representatives, successors, or assigns to secure patent or similar protection for the said invention in all countries and to vest in the assignee complete title to the said invention and Letters Patent, without further compensation, but at the expense of said assignee, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this 13th day of November, 2001.

(SEAL)

Anthony J. Coyle



(SEAL)

Christopher C. Fraser

(SEAL)

Stephen Manning

STATE OF _____)
)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Anthony J. Coyle personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

My commission expires: _____

STATE OF Massachusetts)
)
COUNTY OF Middlesex)

I, Simonne Corriveau, a Notary Public for said County and State, do hereby certify that Christopher C. Fraser personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 13th day of November, 2001.

(Official Seal)

Simonne Corriveau

Notary Public

My commission expires: 9/1/2006

STATE OF _____)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Stephen Manning personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

My commission expires: _____

RTA01/2101419v1

ASSIGNMENT

THIS ASSIGNMENT, made by us, Anthony J. Coyle, citizen of the United States of America, residing at 30 Clarendon Street, Boston, Massachusetts 02116; Christopher C. Fraser, citizen of the United States of America, residing at 52 Grassland Street, Lexington, Massachusetts 02421; and Stephen Manning, citizen of the United States of America, residing at 151 Mystic Street, Apt. M5, Arlington, Massachusetts 02474, respectively;

WITNESSETH: That,

WHEREAS, we are the joint inventors of certain new and useful improvements in B7-H2 MOLECULES, NOVEL MEMBERS OF THE B7 FAMILY AND USES THEREOF for which an application for United States Letters Patent has been filed in the United States Patent and Trademark Office on July 20, 2001, under Application No. 09/910,174, and

WHEREAS, Millennium Pharmaceuticals, Inc., a Delaware corporation having a principal place of business at 75 Sidney Street, Cambridge, County of Middlesex, State of Massachusetts 02139, hereinafter referred to as assignee, is desirous of acquiring the entire right, title and interest in and to said invention as described in said application, and in and to any and all Letters Patent which shall be granted therefor in the United States of America and all foreign countries;

NOW, THEREFORE, To Whom It May Concern, be it known that for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, we have sold and by these presents do hereby sell, assign, transfer, and convey unto the said assignee, its successors and assigns, the entire right, title, and interest in and to the said invention and application, and in and to any and all continuations, continuations-in-part, or divisions thereof, and in and to any and all Letters Patent of the United States of America and all foreign countries or reissues thereof which may be granted therefor or thereon, for the full end of the term for which said Letters Patent may be granted, together with the right to claim the priority of said application in all foreign countries in accordance with the International Convention, the same to be held and enjoyed by said assignee, its successors and assigns, as fully and entirely as the same would have been held and enjoyed by us if this assignment and sale had not been made.

We hereby request that said Letters Patent be issued in accordance with this assignment.

We further covenant and agree that, at the time of the execution and delivery of these presents, we possess full title to the invention and application above-mentioned, and that we have the unencumbered right and authority to make this assignment.

We further covenant and agree to bind our heirs, legal representatives, and assigns promptly to communicate to said assignee or its representatives any facts known to us relating to said invention, to testify in any interference or legal proceedings involving said invention, to execute any additional papers which may be requested to confirm the right of the assignee, its representatives, successors, or assigns to secure patent or similar protection for the said invention in all countries and to vest in the assignee complete title to the said invention and Letters Patent, without further compensation, but at the expense of said assignee, its successors, assigns, and other legal representatives.

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this and
day of November, 2001.

(SEAL)

Anthony J. Coyle

(SEAL)

Christopher C. Fraser

(SEAL)

Stephen Manning

STATE OF _____)
)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Anthony J. Coyle personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

My commission expires: _____

STATE OF _____)
)
COUNTY OF _____)

I, _____, a Notary Public for said County and State, do hereby certify that Christopher C. Fraser personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, 2001.

(Official Seal)

Notary Public

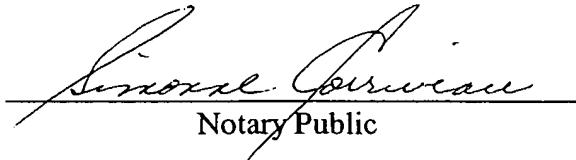
My commission expires: _____

STATE OF Massachusetts)
COUNTY OF Middlesex)

I, Simonne Corriveau, a Notary Public for said County and State, do hereby certify that Stephen Manning personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 2nd day of November, 2001.

(Official Seal)


Simonne Corriveau
Notary Public

My commission expires: 9/1/2006

RTA01/2101419v1